WHAT IS CLAIMED

1.   A multiport device comprising:

a plurality of receive ports, the receive ports receiving frames in a packet-switched network, the frames each having a source field indicating the source of the frame and a destination field indicating an intended destination for the frame;

5   a plurality of transmit ports, the transmit ports configured to transmit the frames in the packet-switched network; and

an internal rules checking circuit coupled to the receive ports and configured to determine frame forwarding information that indicates which of the plurality of transmit ports the received frames should be transmitted from, the internal rules

10   checking circuit including

a first address table including a plurality of addressable table entries for storing frame forwarding information,

a first source address lookup component configured to access the first address table at a table address based on at least the source field of the frames,

15   a first destination address lookup component configured to access the first address table at a table address based on at least the destination field of the frames to obtain the frame forwarding information of the frame,

a second address table including a plurality of addressable table entries for storing frame forwarding information,

20   a second source address lookup component configured to access the second address table at a table address based on at least the source field of the frames,

a second destination address lookup component configured to access

the second address table at a table address based on at least the destination field

25   of the frames to obtain the frame forwarding information of the frame, and

a source address learning engine connected to the first and second

source address lookup components and the first and second address tables, the

source address learning engine, in response to a request from the first source

address lookup component relating to a first frame, updating the first address table

30   to include information relating to the frame forwarding information for the first frame,

and in response to a request from the second source address lookup component

relating to a second frame, updating the second address table to include

information relating to the frame forwarding information for the second frame.

2.   The multiport device of claim 1, wherein the internal rules checking

circuit further includes:

an ingress filter coupled to the plurality of receive ports, the ingress filter

distributing header information of each of the received frames to one of the first and

5   second source address lookup components.

3.   The multiport device of claim 2, wherein the internal rules checking

circuit further includes:

an egress filter coupled to an output of the first and second destination

address lookup components, the egress filter receiving frame descriptor information

5   from the first and second destination address lookup components and transmitting

the received frame descriptor information into a single output stream of frame

descriptors.

4.   The multiport device of claim 3, wherein the first source address lookup component and the first destination address lookup component function as a first frame pipeline and the second source address lookup component and the second destination address lookup component function as a second frame pipeline.

5.   The multiport device of claim 3, further including:

a port vector queue coupled to the egress filter, the port vector queue receiving the single output stream of frame descriptors and forwarding the frames corresponding to the frame descriptors to appropriate ones of the transmit ports.

6.   The multiport device of claim 1, wherein the source address learning engine gives equal priority to requests from the first source address lookup component and the second source address lookup component.

7.   The multiport device of claim 1, wherein the table address accessed by the first and second source address lookup component is derived from a hashing algorithm that hashes at least the source field of the frame.

8.   The multiport device of claim 1, wherein the table address accessed by the first and second destination address lookup component is derived from a hashing algorithm that hashes at least the destination field of the frame.

9.   A multiport device comprising:

a plurality of receive ports, the receive ports receiving frames in a packet-switched network, the frames having a source field indicating the source of the frame and a destination field indicating an intended destination for the frame;

5   a plurality of transmit ports, the transmit ports configured to transmit the frames in the packet-switched network;

an internal rules checking circuit coupled to receive input frame header information from the receive ports and configured to determine frame forwarding information that indicates which of the plurality of transmit ports the received frames

10   should be transmitted from, the internal rules checking circuit including a plurality of frame lookup components operating in parallel, each of the plurality of frame lookup components being associated with an address table, synchronously receiving the frame header information received by the internal rules checking circuit, and identifying the frame forwarding information for the received frame header

15   information from the address table associated with the frame lookup component; and

a port vector queue connected to the internal rules checking circuit, the port vector queue receiving the frame forwarding information identified by the internal rules checking circuit and forwarding the frame forwarding information to

20   appropriate ones of the transmit ports.

10.   The multiport device of claim 9, wherein each of the plurality of frame lookup components in the internal rules checking circuit further comprises:

a source address lookup component configured to access the address table of the associated frame lookup component at a table address based on at least the

5   source field of the received frame header information, and

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a destination address lookup component configured to access the address table of the associated frame lookup component at a table address based on at least the destination field of the received frame header information to obtain the frame forwarding information for the received frame.

11.   The multiport device of claim 10, wherein the internal rules checking circuit further includes:

a source address learning engine coupled to each of the frame lookup components, the source address learning engine, in response to a request from a source address lookup component, updating the address table associated with the requesting source address lookup component to include the frame forwarding information for the frame.

12.   The multiport device of claim 9, wherein the internal rules checking circuit further includes:

an ingress filter coupled to the plurality of receive ports, the ingress filter distributing each of the received frame header information to one of the plurality of frame lookup components.

13.   The multiport device of claim 9, wherein the internal rules checking circuit further includes:

an egress filter coupled to an output of each of the plurality of frame lookup components, the egress filter receiving the frames from each of the plurality of frame lookup components and transmitting a single output stream of frame descriptors.

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14. The multiport device of claim 11, wherein the source address learning engine gives equal priority to requests from each of the frame lookup components.

15. The multiport device of claim 10, wherein the table address accessed by the source address lookup components is derived from a hashing algorithm that hashes at least the source field of the frame header.

16. The multiport device of claim 10, wherein the table address accessed by the destination address lookup component is derived from a hashing algorithm that hashes at least the destination field of the frame header.

17. A method of determining frame forwarding information for frames received in a network device, the method comprising:

receiving frames at the network device, the frames including a source field indicating the source of the frame and a destination field indicating an intended

5 destination for the frame;

distributing the frames among a plurality of frame lookup components implemented in parallel with one another, each of the frame lookup components coupled to an associated address table and configured to look up a frame forwarding descriptor for each of the received frames from the associated address

10 table, the frame forwarding descriptor identifying the frame forwarding information;

receiving the frame forwarding descriptors from the plurality of frame lookup components and transmitting the frame forwarding descriptors to an output queue corresponding to the frame forwarding descriptor; and

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transmitting the frames associated with the frame forwarding descriptors to

15   output ports of the network device based on the content of the frame forwarding

descriptors.

18.   The method of claim 17, wherein the frame forwarding descriptors

include a port vector field that indicates appropriate ones of the output ports.

19.   A multiport device for determining frame forwarding information for

frames received in a network, the multiport device comprising:

means for receiving frames, the frames including a source field indicating the

source of the frame and a destination field indicating an intended destination for the

5   frame;

means for distributing the frames among a plurality of frame lookup

components implemented in parallel with one another, each of the frame lookup

components coupled to an associated address table and configured to identify a

frame forwarding descriptor for each of the received frames from the address table,

10   the frame forwarding descriptor identifying the frame forwarding information;

means for receiving the frame forwarding descriptors from the plurality of

frame lookup components and transmitting the plurality of received frame

forwarding descriptors to output queues; and

means for transmitting the frames associated with the frame forwarding

15   descriptors to output ports based on the content of the frame forwarding

descriptors.